

Incident at Brookhaven National Laboratory

By George Brozowski - Region 2

From January 21 to the present, staff members of the Radiation and Indoor Air Branch (RIAB) have been investigating a tritium incident, which was discovered in on-site groundwater monitoring wells

downgradient of the High Flux Beam Reactor (HFBR) on the grounds of the Brookhaven National Laboratory (BNL).

BNL is a 2,265 acre multidisciplinary scientific research center located in Suffolk County, NY. The site that it now occupies was once Camp Upton, an US Army installation. The Atomic Energy Commission (AEC) was given title to the property in 1947. In 1975, ownership was transferred to the Energy Research and Development Administration. Two years later, BNL became the property of the Department of Energy (DOE).

Between December 5 and January 16, BNL analyzed groundwater samples in the vicinity of its High Flux Beam Reactor (HFBR) and found levels in two wells ranging between 454-5530 pCi/l of tritium in one well and between 2,520-52,800 in another. The reactor was shut down on December 21, 1996 for routine maintenance. BNL installed two monitoring wells 200 feet southeast of the HFBR. Sampling at monitoring wells and additional sites in the area of the HFBR revealed tritium concentrations ranging from 750 to 651,000 pCi/l, which is 32 times the U.S. EPA Safe Drinking Water standard of 20,000 pCi/l, as reported in 40 CFR 141.16, Table A.

The most likely source of the tritium is from the 68,000 gallon spent fuel pool within the reactor building, although other sources have not been ruled out. It has been estimated that the leak from the spent fuel pool has been ongoing for 10-12 years. BNL is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priority List (NPL) site and has groundwater contamination from other pollutants' both chemical and radionuclide (Strontium-90). This latest incident exacerbates the problems already encountered on the site.

RAIB directly regulates the air emissions of radionuclides from BNL pursuant to the radionuclide NESHAPs rule (40 CFR 61, Subpart H). BNL has been in compliance with the rule for the past seven years.

On January 23, 1997, Paul Giardina, Eric Simpson and George Brozowski met with the Director of the BNL Health and Safety Division and inspected the site. Prior to our meeting, an arrangement was made between DOE and EPA Region 2 which has EPA's National Air and Radiation Environmental Laboratory (NAREL) conducting split analysis of all water samples for all wells involved in the tritium plume characterization. Also, NAREL is analyzing for other radionuclides base on the Region 2 needs. The first of the water samples were taken by RIAB for analysis by NAREL on January 23, the same day the Region had on-site presence.

Very low levels of tritium have been detected at monitoring locations at the site boundary and off-site. No one is drinking contaminated water and there is no immediate health threat. Recent data indicate that the plume has traveled at least 1,900 feet, but does not exceed the MCL at 3,600 feet downgradient.

Since that initial discovery of the tritium contamination, several contamination plumes have been located including:

- a Cobalt-60 plume presumably from another building on-site (Building 830),
- an additional tritium plume from a concrete sump connected to the base of the HFBR stack and the fan house for the Brookhaven Graphite Research Reactor (BGRR), which was shut down in 1968.

The DOE Brookhaven Group Office suspended fuel handling operations at the Brookhaven Medical Research Reactor (the other BNL reactor). According to the "Occurrence Report" filed by BNL, "On March 3, 1997, a step in a fuel handling operation at the Brookhaven Medical Research Reactor (BMRR) was performed without realizing that the written procedural step contained an error." None of these discoveries pose immediate health and safety threats but have been widely reported in the media and have shaken public confidence in BNL.

Senator Alphonse D'Amato and Representative Michael Forbes have jointly written to DOE asking for a "full-scale, top-to-bottom review" of BNL. Both politicians have been very insistent that the contamination is addressed as soon as possible and that EPA help expedite. They have also contacted Administrator Browner urging the continued commitment of EPA in reviewing the occurrence and requested EPA to ensure that the cleanup is conducted quickly.

On February 19, 1997, Tara O'Toole (DOE Assistant Secretary of Environmental Health and Safety) publicly committed to the installation of a double-walled stainless steel liner into the reactor spent fuel pool. This will require the removal and disposal of the spent fuel rods that are currently stored in the pool. Such a process will take more than a year to complete by DOE's own estimate. The reactor will not be restarted until the leak has been corrected. DOE has also committed to an interim contamination control measure which involves the pumping of the leading edge of the tritium plume and sending it to an onsite recharge basin. This will be done under DOE/BNL Superfund removal authority. Dr. O'Toole has also committed BNL to meeting the EPA Safe Drinking Water Standard.

BNL plans to conduct four shipments of 200 fuel rods that will be shipped via a barge to Newport News, Virginia. From there, the casks will be trucked to the DOE Savannah River Site. The first shipment is to commence in May. Loading of the five fuel shipment containers began on Monday, April 14 for the first spent fuel shipment, scheduled for May 1997.

On March 10, 1997, DOE commenced drilling horizontal wells under the reactor building up and downgradient of the spent fuel pool to pinpoint the source of the tritium contamination. Hydrogeologic and groundwater modeling expertise is being provided from the Robert S. Kerr Environmental Research Laboratory. These groundwater experts are augmenting regional expertise. Radiological analyses of groundwater samples are being conducted for the Region by NAREL and have been ongoing since discovery of the initial tritium contamination. EPA's data shows very close agreement with BNL/DOE. Results of sampling from the horizontal borings are expected in early April.

Future Action:

Groundwater modeling and engineering assessment were discussed on April 9, 1997. EPA will do an expedited review of the new technical information. The pump and recharge system is expected to be started by April 20, 1997. Groundwater investigations to define the plume will continue.

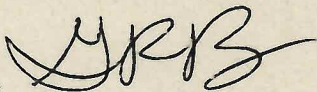
"60 Minutes" met with BNL Public Affairs staff members on April 1 to discuss an upcoming presentation either in late Summer or early Fall, 1997.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: February 12, 1997

SUBJECT: Wednesday, February 5, 1997 - Meeting at BNL

FROM: George P. Brozowski
Environmental Scientist



TO: Paul A. Giardina, Chief
Radiation and Indoor Air Branch

The purpose of this memorandum is to provide you with our notes from meeting at Brookhaven National Laboratory (BNL), held on Wednesday, February 5, 1997:

1125 Leave 290 Broadway

1235 Arrive at BNL. Meet with Jerry Granzen. Eric and I requested a computer file of the geoprobe listing and the latest information regarding the placement of future geoprobes. Jerry will be sending us a large map, similar to the site map, listing the permanent monitoring wells. A press release will be developed either today or tomorrow. There has been an increase in staff members of the Department of Energy (DOE) HQ Independent Oversight Review Team to from 6 to 12. Eric mentioned the Phase 2 results from the National Air and Radiation Environmental Laboratory (NAREL) will be in by COB Thursday, February 6, 1997.

1330 Lunch.

1505 Briefing meeting lead by Michael Brooks, Deputy Director, Reactor Safety and Security.

Mike began the meeting by stating that Phases 1 & 2 of geoprobe placement have been completed and Phase 3 will begin either today or tomorrow (Thursday, February 6, 1997). Phase 3 will involve the placement of a minimum of 13 additional geoprobe wells. At this time, probes 25 & 26 are planned in positions between earlier probes 18 & 19, but closer still to the High Flux Beam Reactor (HRBR). Probes 33, 27, & 28 are planned to be placed at points near where phase 2 probes 23 & 24 existed. Probes 32, 31, & 34 will move the tier of wells currently at the 400 ft. mark more westward. Finally, an additional five geoprobes will be marked off on Brookhaven Avenue (800 feet south of the reactor).

As of February 4, 1997, a total of 24 geoprobes have been installed and sampled. Four geoprobes upgrade of the facility (GP 1-4) have shown to be less than minimal detectable limits (<MDL). The geoprobes located south of the reactor (GP 5-12) are showing high levels. GP-22 has the highest concentration - 651,000 pCi/l. GP-18 (on the front right side of the reactor) reads 91,000 pCi/l. GP-23 shows 203,000 pCi/l (at 32 ft) and 192,000 pCi/l (36 ft). The geoprobes (GP located 400 feet from the reactor along Temple Avenue) are reading twice the tritium MCL.

A separate project has been started which uses the staff of the Office of Environmental Restoration (OER) who will perform sampling of permanent wells located along the Southern border (both onsite and offsite) These samples will also be sent to NAREL for confirmatory analysis. Bob Miltenberger indicated that he would coordinate with OER on the shipment of the samples. Also, beginning with the phase 3 geoprobe sampling, BNL will enlist the aid of the Princeton Plasma Physics Laboratory to assist in analyzing the groundwater samples.

- 1520 Bill Rowe from the Reactor Division discussed the following methods to test for leaks in the spent fuel pool:

Laser-leak test to determine the water levels should bring sensitivity down to 1 gallon per day from the standard leak test sensitivity of 5 gallons per day.

Chemical tracer test, using perfluorocarbons (PFC), molecularly similar to freon. The technology exists to detect these compounds in very minute traces, in the range of femto-moles. This highly sensitive technique may begin as early as the week of February 10, 1997.

Directional boring, which will enable sampling to occur much closer to the reactor than the geoprobe wells. Soil samples can be retrieved from very near the spent fuel canal and/or other areas of concern. This may aid in pinpointing the leak. Directional boring may also be used in tandem with the perfluorocarbon tracers.

Bill mentioned the July 1995 incident in which a seal came loose on a primary pump, causing water to become backed up in a vent and then spill onto a clean-out area. He also confirmed that, according to staff calculations, a 1 Curie release could account for the groundwater tritium concentrations being discovered.

To reduce the tritium concentrations in the reactor coolant. HFBR staff is planning to include an additional the shipment of spent D_2O to Canada to the regular schedule of disposal and replacement with clean D_2O . The addition of one extra D_2O replacement to their regular schedule will drop average operational coolant concentrations of tritium to 1.1 pCi/L from the current 1.9 pCi/L.

A test was conducted on the sanitary lines between the reactor and Building 801, which indicated normal conditions. Further, it was indicated that the reactor coolant lines have been shown to be in pristine condition with good flow rates. These lines run from the reactor to the clean-up system through the concrete slab.

- 1600 Bill Gunther of OER discussed the vertical profiles of tritium in the permanent monitoring wells. Readings of 1,000 pCi/l were found in the Southern boundary wells.

A discussion of additional spent fuel shipments, similar to the one back in November, 1996, will occur sometime in May, 1997.

- 1630 The meeting concluded with a scheduled trip for NYSDEC and SCDOH to view the reactor. Bob Casey mentioned that he will be presenting the latest facts and figures to the Suffolk County Task Force on Thursday February 6. A press release will go out either tonight or tomorrow.

1645 Leave BNL.

1800 Drop off Eric in the Bronx.

1835 Arrive home.

cc: E.J. Simpson

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: January 30, 1997

SUBJECT: Wednesday, January 29, 1997 Field Trip to BNL

FROM: George P. Brozowski
Environmental Scientist



TO: Paul A. Giardina, Chief
Radiation and Indoor Air Branch

The following is our timeline regarding our field trip to BNL:

- 1105 Leave 290 Broadway
- 1215 Arrive BNL. Meet with Jerry Grazen.
- 1300 Meet with Jerry, Douglas Paquette (Geologist) and Sal Scarpitta (Lab Manager) at the High Flux Beam Reactor (HFBR) to collect water samples from the geoprobes (GP) and the permanent monitoring wells. Douglas made a map of the geoprobes and monitoring wells for our information (see attached).
- 1335 Collect a 250 ml amber glass water sample from GP-19 (56-58 ft).
- 1355 Purging monitoring well 75-12 for collection. Meet the DOE HQ Office of Independent Oversight Review Team [Victor Crawford, Dave Allard (Contracting HP) and Ed Bradley]. This review team was scheduled to come to BNL prior to the tritium incident.
- 1425 Call to Paul Giardina to update on sampling procedures.
- 1430 Collect a 25 ml amber glass water sample from 75-12.
- 1445 While waiting to collect additional samples, Eric and I met with Mike Kilpatrick and Dave Stadler from DOE HQ Office of Independent Oversight. Mike and Dave informed Eric and I that a safety management team from DOE HQ will be on-site within the next week to perform an environmental management review. This review was requested by Senator D'Amato, in his letter to the DOE Secretary. Mike and Dave can be reached at (516) 344-4229.

The review team wants to know the following:

- What BNL is doing to identify the source of the leak.
- The ongoing groundwater investigation.
- The results from the labs.

DOE would like to meet with EPA Region II, NYSDEC, and Suffolk County to understand everyone's needs and answer all questions. After our meeting, Eric and I returned to collect water samples.

1510 Collect a 250 amber glass water sample from GP-15 (73-75 ft).

1525 Collect a 250 amber glass water sample from GP-16 (60-62 ft).

1535 Collect a 250 amber glass water sample from monitoring well 75-11 (70 ft).

1536 Collect a 250 amber glass water sample from GP-19 (52-54 ft).

1600 Leave BNL

1730 Arrive 290 Broadway

Attachment:

cc: E. Simpson

1/29/97

PROPOSED TEST WELL (GEOPROBE) LOCATIONS

065-01

AREA OF DETAIL

REACTOR STACK

LEGEND

- Permanent Monitoring Well
- Proposed Test Well

SANITARY LINE

CORNELL AVENUE

RAILROAD STREET

BLDG 480 MATERIALS SCIENCES

BLDG 485 SAFETY AND ENVIRONMENTAL PROTECTION

TEMPLE PLACE



Meters

0 10 20 30

0 100

Feet

NOTE TO: MARY NICHOLS
1997

January 24,

FROM: LARRY WEINSTOCK

SUBJECT: TRITIUM INCIDENT IN REGION II

During the period Dec. 11 and Jan. 15 tritium was found in an onsite test well at the **Brookhaven National Laboratory (BNL)**, at **2 times the drinking water standard**.

This tritium is believed to be associated with a reactor used to generate radioisotopes for medical use. The reactor and its spent fuel storage pool contain high concentrations, and a small leak could easily cause this problem.

Senator D'Amato and Representative Michael Forbes have jointly written to DOE (asking for a "full-scale, top-to-bottom review" of BNL) and also to the Administrator (urging sending a senior EPA official to BNL to find out what occurred and to ensure protection of the public and workers). These letters are attached.

The Region II Radiation and Indoor Air Branch Chief, Paul Giardina, has been in close contact with the BNL official in charge of safety, Bob Casey, who has been cooperative. **Yesterday (thursday, January 23) EPA collected split samples with DOE, and we will analyze up to 70 samples per week at ORIA's National Air and Radiation Environmental Laboratory in Montgomery.**

We believe Region II has this situation well in hand. Giardina will brief Congressman Forbes' staff this afternoon on EPA activities. **None-the-less, the congressional letter specifically requests higher level EPA attention, and we recommend that you explore with Region II what the EPA response should be.**

Public drinking water is not believed to be in danger. It would take two decades for this onsite contamination to reach the site boundary, by which time dilution and radioactive decay would bring it well below DW standards. In addition, all nearby residences are on city water supplies.

Tritium has been found offsite before (in the Peconic river), but always at levels below DW standards. (BNL is also currently in compliance with NESHAPs for radiation.)

BNL is sinking additional test wells to identify the exact source of the

contamination.

BNL is a Superfund site. To date, the primary concern has been contamination by organics. Cleanup standards for radioactive contamination are not in place.

BNL Tritium Groundwater Contamination Incident

Background

In October 1996, Brookhaven National Laboratory (BNL) installed two groundwater monitoring wells near the High Flux Beam Reactor (HFBR) to monitor for potential impacts of that reactor. Groundwater near the HFBR flows in a southeasterly direction at the rate of about 1 foot per day and the migration time for contaminants to reach the southern site boundary would be about 20 years. Potable water supply wells are located north of the groundwater monitoring wells. Each supply well is checked quarterly for all contaminants including radioactivity, and water from the tap is tested daily for radioactivity. BNL's potable water is safe to drink.

Issue

Analysis of the first samples drawn in October were completed on December 5, 1996 and showed Tritium levels of 2,520 and 454 pCi/l [picoCuries per liter]. Tritium is an isotope of Hydrogen containing one proton and two neutrons and referred to as H-3. It has a radioactive half-life of 12.3 years and it is a beta emitter that effects human body tissue as the isotope is primarily borne as one of the hydrogen atoms in water. BNL has subsequently re-sampled these wells between December 11th and January 15th and has found Tritium concentrations ranging from 37,600 to 44,700 pCi/l in one well and between 2,110 and 6,880 pCi/l in the other well. The drinking water standard for H-3 is 20,000 pCi/l; therefore, the latest samples from one of the wells shows that the groundwater exceeds the drinking water standards for Tritium. Since groundwater flow is approximately 1 foot per day, it would take almost 2 half-lives for the contamination to reach the site boundary. BNL is investigating potential sources from within and around the HFBR. Possible sources include: HFBR Spent Fuel Pool, Sanitary Waste Lines, and leaking piping embedded in building basement. BNL employees, local elected and regulatory officials, and key members from stakeholder groups to the media have been notified. The reactor has been shut down until the source of the leak is determined.

From: PAUL GIARDINA
To: CALLAHAN-KATHY, PAVLOU-GEORGE, DCJS01.DCJSPO1.RICH...
Date: 1/24/97 3:07pm
Subject: BNL H-3 Incident Briefing for Congressman Forbes' Staffer

We [Richard Cahill, Berry Shore, Michael DeBonis and I] briefed Ms. Alexis Mathios from Congressman Forbes' office by telephone at 2:30 PM.

The points we mentioned included:

1. Our on-site visit to BNL yesterday which included working out a data collection and analysis protocol, mutually with BNL, that would allow for collecting the highest quality data from which to base future decision making. I made sure she was aware that we actually collected 5 samples yesterday.
2. We discussed the mutual goal we have with BNL that this incident will not cause any kind of exposure or dose consequences to anybody off site or any employee on site. With this we discussed that we were all (DOE and EPA) committed to keeping the contamination contained on site and we were certain we would be able to do this.
3. I mentioned that once the initial data was analyzed from the 17 geoprobe locations, that BNL and EPA would have a better understanding of what the next step options would be. I mentioned EPA capabilities in the area of tracer studies and I referred to the high level of capabilities BNL possesses. **I clearly cautioned to expect analytical results that would most probably show tritium levels to be higher than the first readings.**
4. I tried to clearly identify those potential sources of any leakage and in general categorized most of the possible culprits as being from 35 year old + construction. We, of course, could make no predictions on the source without further data.
5. Emphasis was placed on the fact that the three EPA staff who are involved in this matter are on EPA's National Radiological Emergency Response Team (RERT) and that several of the BNL staff are on the DOE's Radiological Assistance Program (RAP) team.
6. Ms. Mathios is planning a visit to the area either February 13 or 14 and we should work with BNL to assure her data needs are met.
7. We also indicated our willingness to reachout to staffers on Senator D'Amato's staff to provide a similar briefing and Ms. Mathios indicated she we contact Mr. Phipps of Senator D'Amato's staff to help facilitate this.

Ms. Mathios indicated she was pleased with our attention to this incident so far.

I would categorize this as a successful and collegial briefing.

CC: BROZOWSKI-GEORGE, R2NYC04.R2OSWSF1.WING-BOB, DEBON...

Brozowski
Be sure to copy this
are for
on file
Pen

From: PAUL GIARDINA
To: CALLAHAN-KATHY
Date: 1/27/97 8:08am
Subject: BNL Groundwater Samples

Results preliminarily found by BNL at geoprobe well #8 which is very close to the the original BNL with the highest concentrations is reading over 200,000 pCi/l for tritium or over 10 times the drinking water standard.

This should not be alarming per se as an environmental problem but when BNL finishes QA/QCing the data and once we analyze and QA/QC our split, reporting of these data will take place; and that will undoubtedly cause some problems with media attention.

THESE DATA ARE NOT YET READY FOR RELEASE.....THIS IS A HEADS UP ONLY!

CC: DCJS01.DCJSPO1.RICHARDSON-ALLAN, MON01.MONPO01.WIN...

From: PAUL GIARDINA
To: PAVLOU-GEORGE
Date: 1/27/97 8:47am
Subject: More Brookhaven Tritium -Reply -Reply -Reply -Reply

I didn't get Bob's incoming, however, the actual HFBR is a very unlikely source of the tritium considering the safeguards around the reactor. The most likely sources of contamination as mentioned by BNL in their fact sheet which Bob and Mary should have are as follows:

1. The spent fuel pool/canal
2. Sanitary lines that traverse areas around the HFBR
3. Piping embedded in the HFBR building which may be leaking.

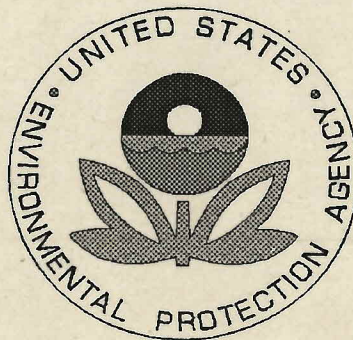
From the way this data is beginning to look, it appears it is coming from a discrete source someplace in the immediate facility of the HFBR but not the actual reactor.

CC: ESIMPSON, GBROZOWS, MDEBONIS

Suffolk County Task Force
Brookhaven National Laboratory

Presentation By

Paul A. Giardina, Chief
Radiation & Indoor Air Branch
US EPA Region II



Tritium Incident - January 17, 1997

- What Is Tritium? - An isotope of hydrogen.
- Contains one proton and two neutrons.
- Has a half-life of 12.3 years.
- Beta (electron) emitter.
- Referred to as H-3.

EPA Response To Tritium Incident

- On January 16, routine analysis of permanent monitoring wells indicated elevated levels of tritium in the vicinity of the High Flux Beam Reactor (HFBR), as high as 43,800 picocuries per liter (pCi/l).
- A picocurie is defined as a trillionth part of a curie, and a curie is the basic unit used to describe the concentration of radioactivity in a sample of material.

EPA Response to Tritium Incident

- On January 21, Radiation and Indoor Air Branch requested an update from BNL.
- On January 23, initial meeting between DOE-BNL and EPA took place.
- It is agreed that EPA will perform independent analysis of future groundwater samples taken onsite.

EPA Response to Tritium Incident

- First 5 (out of 62) water samples were taken and shipped to EPA's National Air and Radiation Environmental Laboratory (NAREL), located in Montgomery, AL.
- DOE-BNL & EPA have been working together to achieve the ultimate goal of assuring that the contamination will have no adverse effect to public health and safety.

EPA Response to Tritium Incident

- The drinking water, both onsite and offsite, meet EPA's Safe Drinking Water standards.

EPA-BNL Split-Sampling

- EPA has independently analyzed all Groundwater samples for Tritium.
- EPA has performed spot checks for fission products in selected samples: Cobalt-60, Cesium-137, and Strontium-90.
- On January 29, EPA collected additional groundwater samples, fixed monitoring wells included.

Split-Sampling Results

- EPA's analysis of Phase 1 and Phase 2 groundwater samples correlate well with the DOE-BNL data.
- Spot checks for radionuclides other than tritium have shown that none are present in detectable quantities.

High Flux Beam Reactor

- On January 31, EPA inspects the reactor building, the spent fuel pool, and the clean-out area.
- Conversations with HFBR staff indicate that two likely causes for contamination have been identified and are being investigated by DOE and BNL.
 - (1) July 1995 - spill of 150 gallons of heavy water.
 - (2) A leak in the spent fuel pool.

- On February 5, EPA, DOE-BNL, the Regional Director of the New York State Department of Environmental Conservation, and Suffolk County Department of Health Services meet onsite to discuss probable routes of contamination and efforts to pinpoint the source.
- On February 14, EPA attends a scoping meeting onsite with HFBR staff and contractors to discuss the effects of horizontal boring and vertical drilling on reactor structural integrity.

Peconic River Report

- Prepared by New York State Department of Health to address concerns over the discharge of radioactive contaminants into the Peconic River by BNL.

Annual Average Values in pCi/l for BNL Water Samples From Peconic River at Manorville

Year	Number of Samples	Gross Beta	Tritium
1970	1	5	3,700
1971	No samples collected - drought		
1972	4	9	3,800
1973	12	9	4,100
1974	15	10	3,300
1975	11	13	2,300

Annual Average Values in pCi/l for BNL Water Samples From Peconic River at Manorville - continued

Year	Number of Samples	Gross Beta	Tritium
1976	12	11	4,500
1977	12	10	5,800
1978	11	5	2,200
1979	12	7	3,200
1980	11	9	3,100

Annual Average Values in pCi/l for BNL Water Samples From Peconic River at Manorville - continued

Year	Number of Samples	Gross Beta	Tritium
1981 ^a	5	8	4,100
1982	8	10	5,800
1983	6	7	3,400
1984	7	5	2,700
1985	6	10	4,400

^a - 4 of the 5 samples were analyzed for tritium.

Annual Average Values in pCi/l for BNL Water Samples From Peconic River at Manorville - continued

Year	Number of Samples	Gross Beta	Tritium
1986	12	15	1,600
1987	6	7	2,000
1988	5	13	2,600
1989	8	11	1,400
1990 ^b	12	9	900

^b - 11 of 12 samples were analyzed for tritium.

Annual Average Values in pCi/l for BNL Water Samples From Peconic River at Manorville - continued

Year	Number of Samples	Gross Beta	Tritium
1991	12	13	1,300
1992	11	16	3,700
1993	9	15	1,800
1994	4	3	1,500
1995	No samples collected - drought		
1996	2	6	700

Peconic River Report - Findings

- Maximum Tritium Concentration reported by NYSDOH - 24,900 pCi/l (1976).
- Contaminants in the river are from BNL.
- EPA strongly suggests effluent discharge records be compared with the historical State Environmental radiation data as well as with any BNL environmental radiation data to determine if the current and future effluent discharge system is providing elimination of radionuclide discharges that are low as reasonably achievable (ALARA).

Suffolk County Department of Health Services - Historical Summary

- Since 1979, Tritium has been detected in 18 private wells. Highest concentration found 7,238 pCi/l (September, 1993).
- August 12, 1996 Quarterly Test - Three private wells on North Street contain 1,450-2,870 pCi/l.
- Peconic River sample - 1,330 pCi/l (5/96).

Role of EPA

- Protect public health and safety.
- Monitor the radionuclide air emissions from BNL. BNL must comply with the requirements in Title 40, Code of Federal Regulations (CFR), Part 61, Subpart H, *National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Emissions of Radionuclides Other Than Radon From DOE Facilities*.

NESHAPs Standard

- According to 40 CFR 61.92, “Emissions of radionuclides from DOE facilities shall not exceed those amounts that would cause any member of the public to receive in any year any effective dose equivalent of 10 mRem/year.”
- According to 40 CFR 61.94, “the owners or operators of each facility shall submit an annual report to the EPA Regional Office by June 30 of the following year.”

1995 DOE Site Boundary Doses

Facility Name	Site Boundary Dose	In Compliance?
Los Alamos National Lab	5.1 mRem	Yes
Oak Ridge National Lab	2.0 mRem	Yes
Savannah River Site	0.5 mRem	Yes
Brookhaven National Lab	0.07 mRem	Yes
Argonne National Lab	0.0005 mRem	Yes

Inspection of DOE Facilities

Purpose:

- To assure air emission control equipment specified in the facility's NESHAPs applications is installed and is operating properly.
- To assure radiation protection emergency response procedures contain the correct emergency notification contact personnel and telephone numbers.
- To assure records required under Subpart H ruling are available and up-to-date.

Region II - DOE Inspection Program

Facility Name	Initial Inspection	Last Inspection	In Compliance
WVDP	06/29/89	06/23/92	Yes
BNL	08/02/89*	07/20/94	Yes
KAPL	08/21/89	09/27/94	Yes
PPL	05/19/90	05/03/94	Yes
EML	05/20/91	04/20/93	Yes

* - The initial inspection of BNL revealed four sources where modifications were being done without appropriate approvals and therefore BNL was temporarily out of compliance with the NESHAPs rule. The follow-up inspection, conducted on December 27, 1989 found all sources to be in compliance.

Conclusion - NESHAPS

Based on their annual reports and EPA inspections, BNL is in compliance with 40 CFR 61, Subpart H.

What The Future Holds

- EPA will continue to work to oversee DOE and BNL provide remedies to this tritium contamination and all other contamination problems onsite.
- BNL will be required to meet the standards of the Safe Drinking Water Act for all contaminants, be they radionuclide or chemical.

What The Future Holds

- BNL must meet the very stringent EPA standards governing the airborne release of radionuclides.
- BNL is well below these standards.

Conclusion

- EPA will use our statutory mandates to assure that BNL meets Federal environmental laws and poses no health threats now or to our future generations.

BNL/NAREL Geoprobe Water Sample Results (so far)

